

or other tool to disengage the mounting tang on the bracket from the tab on the connector.

#### NOTE

*It is necessary to remove large rectangular connectors from the mounting*

*bracket for disassembly. The mounting bracket tang also locks together the connector halves. The connector must be free from the mounting bracket to disassemble or assemble the connector.*

Small connectors and large round connectors may be disassembled by pulling or prying out the retaining tab at the lower end of the outer half (**Figure 3**) and pulling out the inner connector half. Large rectangular connectors are equipped with a locking tab on the outer body (**Figure 4**). Depress the tab, then pull out the inner half. It may be necessary to remove an adjacent connector from the mounting bracket to gain sufficient space to remove the desired connector. The following connectors must be removed from the mounting bracket for disassembly or assembly.

1. Combination meter connector (B, **Figure 1**).
2. Handlebar switch connector (C, **Figure 1**).
3. Gear position switch connector (A, **Figure 2**).

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## CHARGING SYSTEM

The charging system consists of the battery, alternator and a voltage regulator/rectifier. A 30-amp main fuse protects the circuit.

Alternating current generated by the alternator is rectified to direct current. The voltage regulator maintains the voltage to the battery and additional electrical loads at a constant voltage despite variations in engine speed and load.

### Troubleshooting

Refer to Chapter Two.

### Battery Voltage Check

To obtain accurate charging system test results, the battery must be fully charged.

Before testing the charging system, measure battery voltage as follows:

1. Remove the seat (Chapter Fifteen).
2. Connect a digital voltmeter between the battery negative and positive terminals (**Figure 5**) and measure the battery voltage. A fully charged battery will read between 13.0-13.2 volts. If the voltage reading

is less than this amount, recharge the battery as described in Chapter Three.

### Charging System Current Draw Test

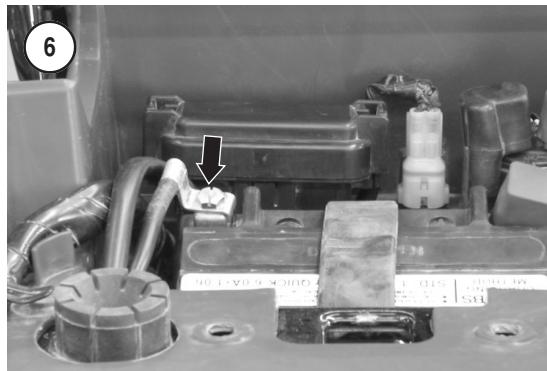
Perform this test before performing the charging voltage test.

1. Remove the seat (Chapter Fifteen).
2. Turn the ignition switch off.
3. Disconnect the negative battery cable from the battery (**Figure 6**).

#### CAUTION

*Before connecting the ammeter into the circuit in Step 4, set the meter to its highest amperage scale. This will prevent a large current flow from damaging the meter or blowing the meter's fuse, if so equipped.*

4. Connect an ammeter between the battery ground cable and the negative battery terminal.
5. Switch the ammeter between its highest and lowest amperage scale while reading the ammeter scale. The ammeter reading should be less than 1.0 mA.
6. A current draw higher than 1.0 mA will discharge the battery. Dirt and/or electrolyte on top of the battery or a crack in the battery case can cause this type of problem by providing a path for battery current to follow. Remove and clean the battery as described in Chapter Three. Then reinstall the battery and retest.
7. If the current draw is still excessive, consider the following probable causes.
  - a. Damaged battery.
  - b. Short circuit in system.
8. To find the short circuit, refer to the appropriate wiring diagram at the end of this manual. Measure the current draw while disconnecting each charging system connector one by one. When the current draw rate returns to normal, the circuit with the short circuit is identified. Test the circuit further to find the problem.
9. Disconnect the ammeter from the battery and battery cable.
10. Reconnect the negative battery cable to the battery.
11. Install the seat (Chapter Fifteen).



### Charging System Voltage Test

This procedure tests charging system operation. It does not measure maximum charging system output. **Table 1** lists charging system specifications.

To obtain accurate test results, the battery must be fully charged; measure battery voltage as described in the *Battery Voltage Check* section.

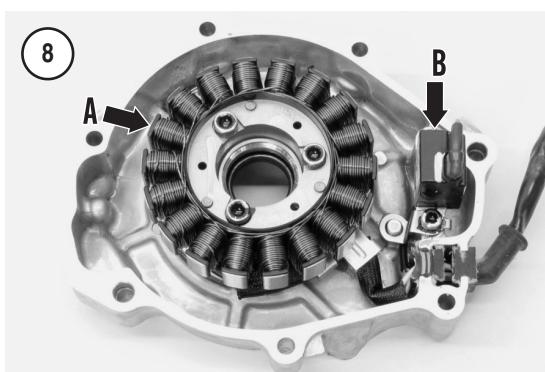
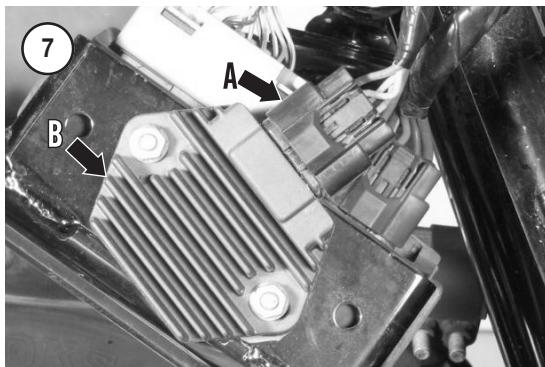
1. Start and run the engine until it reaches normal operating temperature, then turn the engine off.
2. Connect a tachometer to the engine following its manufacturer's instructions.
3. Connect a 0-20 DC voltmeter to the battery terminals as shown in **Figure 5**.
4. Start the engine and allow it to run at idle speed.
5. Gradually increase engine speed from idle to 5000 rpm and read the regulated voltage reading on the voltmeter and compare it to the regulated voltage reading in **Table 1**. If the regulated voltage is higher than 15.5 volts, check for a shorted wiring harness, damaged ignition switch or a faulty regulator/rectifier; perform *Regulator/Rectifier Wiring Test* in this section. If the regulated voltage reading is correct, but there is a problem in the charging system, the battery may be faulty.
6. Disconnect the voltmeter and tachometer.
7. Install the seat (Chapter Fifteen).

### Regulator/Rectifier Wiring Harness Test

1. Disconnect the regulator/rectifier electrical connector. See A, **Figure 7**, typical.

#### NOTE

*Make all of the tests (Steps 2-4) at the wiring harness connector; not at the regulator/rectifier.*



2. Check the battery charge lead as follows:
  - a. Connect a voltmeter between the red and green connectors.
  - b. With the ignition switch off, the voltmeter should read 13.0-13.2 volts (battery voltage).
  - c. If the battery voltage is less than specified, check both wires for damage.
  - d. Disconnect the voltmeter leads.
3. Check the ground wire as follows:
  - a. Switch an ohmmeter to  $R \times 1$ .
  - b. Connect the ohmmeter between the green wire and a good engine ground.
  - c. The ohmmeter should read continuity.
  - d. If there is no continuity, check the green wire for damage.
4. Check the charge coil wires as follows:
  - a. Switch an ohmmeter to  $R \times 1$ .
  - b. Measure resistance between each yellow wire.
  - c. The ohmmeter should read 0.1-1.0 ohms at  $69^{\circ} F$  ( $20^{\circ} C$ ). An infinity reading indicates an open circuit. Test the stator coil resistance as described in this section.

- d. If the resistance reading is excessive, check for dirty or loose-fitting terminals or damaged wires.
5. If any regulator/rectifier measurement is out of specification, replace the regulator/rectifier as described in this chapter.
6. Reconnect the regulator/rectifier electrical connector (A, **Figure 7**).

### Regulator/Rectifier Removal/Installation

1. Remove the seat.
2. Disconnect the negative battery cable from the battery (**Figure 6**).
3. Disconnect the regulator/rectifier unit electrical connector (A, **Figure 7**).
4. Remove the bolts securing the regulator/rectifier (B, **Figure 7**) to the frame and remove it.
5. Install by reversing the preceding removal steps.

## ALTERNATOR

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The alternator consists of the flywheel and stator coil assembly. Flywheel and stator removal and installation procedures are covered in Chapter Five.

### Flywheel Testing

The flywheel is permanently magnetized and cannot be tested except by replacing it with a known good one. The rotor can lose magnetism over time or from a sharp hit, such as dropping it onto a concrete floor. Replace the flywheel if it is defective or damaged.

### Stator Coil Resistance Test

#### NOTE

*The stator coil is also referred to as the charge coil.*

The stator coil (A, **Figure 8**) is mounted inside the alternator cover. The stator coil can be tested with the alternator cover mounted on the engine.

1. Disconnect the alternator/pulse generator connector (B, **Figure 2**).
2. Use an ohmmeter set at  $R \times 1$  and measure resistance between each yellow wire at the alternator end of the connector. **Table 1** lists the specified stator coil resistance.

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